Michael Lankford

Homework 2

2/4/2023

1. CPI total = (CPIi \* Clock Rate) Clock Cycle = Instruction Count \* CPI total

A. CPI total P1 = (.1 \* 1) + (.2 \* 2) + (.5 \* 3) + (.2 \* 3) = 2.6

CPI total P2 = (.1 \* 2) + (.2 \* 2) + (.5 \* 2) + (.2 \* 2) = 2

B. Clock Cycle P1 = 1E6 \* 2.6 = 2600000

Clock Cycle P2 = 1E6 \* 2.0 = 2000000

2. CPI = Frequency change = Speedup =

A. CPI A = = 1.1

CPI B = = 1.25

B. Frequency change = = 1.3636

C. Speedup A = = 1.67

Speedup B = = 2.27

3. = ET = MFLOPS =

A. = 🡪 9E8 =

B. ET P1 = = 1.125

ET P2 = = .25

MFLOPS P1 = = 1.78E3

MFLOPS P2 = = 1.6E3

4. = \* factor

A. = 70 \* .8 = 56

T = 56 + 85 + 40 + 55 = 236

250 – 236 = 14 / 250 = .056 \* 100 = 5.6%

B. = 250 \* .8 = 200

T = 70 + 85 + 40 = 195

200 – 195 = 5 = Tint

55 – 5 = 50 / 55 = .9091 \* 100 = 90.91%

C. = 250 \* .8 = 200

T = 70 + 85 + 55 = 210

No, you can’t reduce the total time by only reducing branch instructions because the branch instructions are a large enough fraction of the total time.